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PATENT
4001-1194

PC
A3

IN THE U.S. PATENT AND TRADEMARK OFFICE

In re application of

RUMMEL et al.

Conf. 4115

Application No. 10/521,605

Group 2877

Filed January 18, 2005

METHOD AND DEVICE FOR THREE-DimensionALLY DETECTED OBJECTS AND
THE USE OF THIS DEVICE AND METHOD

INFORMATION DISCLOSURE STATEMENT

Assistant Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

May 18, 2005

Sir:

In compliance with Rules 1.97 and 1.98, and in fulfillment of the duty of disclosure under Rule 1.56, the following documents, copies of which are attached to this statement, are made of record on the enclosed sheet.

A concise explanation of the relevance of DE 196 38 727 A1, as advised by our client, is as follows:

Title: Method for Enhancing the Significance of Three-dimensional Measurement at Objects

Claim 1: Method for Enhancing the significance/clarity of three-dimensional measurement at objects with optical recording, projecting patterns and calculating for triangulation characterized in that different areas of projected patterns have different shapes, the different areas being encoded therewith.

Claim 2: Method according...the patterns being geometrical components with different shapes encoding these elements.

Claim 3: ...the geometric components are linear projected elements.

Claim 4: ... the geometric components are formed concentric.

Claim 5: ... the patterns have different shapes of lines encoding the areas.

Claim 6: ... the patterns have interruptions...

Claim 7: ... the different areas of patterns are different with different colors.

Claim 8: ... that the picture information with three-dimensional coordinates is taken from any at least one point from at least two areas of the surface of the concerned objects and are calculated; during the recording different encoded areas of the patterns are projected.

Claim 9: Method for using the invention for medical diagnostic therapy or documentation.

The invention concerns a method for enhancing the three-dimensional measurement on objects... to eliminate varied properties on the variation of picture data...

An object of the invention is to provide a method for enhancing the significance of the three-dimensional measurement on objects as described for the unambiguous identification of a taken picture viewed on its own without the requirement continuity on the surface concerning the viewing and projection direction as described above.

This object is performed in that for fulfilling the three-dimensional measurement on object with spatial projections with the method of triangulation projected areas of pattern are such encoded that the correspondence to an associated area of the projected may be detected with one partial picture segment... knowing the geometrical shapes of the projected patterns and the position of the concerned pattern segment in the picture recorded there may be conceived three-dimensional coordinates with simple calculation by triangulation.

A concise explanation of the relevance of the following items is that we are advised by our client that these references were cited by the German Patent Office in the corresponding German application:

6,341,016; DE 196 38 727 A1; DE 199 63 333 A1; 0 328 443 A1; VUYLSTEKE et al., "Range Image Acquisition with a Single Binary-Encoded Light Pattern", IEEE Transactions on Pattern Analysis and Machine Intelligence, Vol. 12, No. 2, February 1990, pp. 148-164; SALVI et al., "A robust-coded pattern projection for dynamic 3D scene measurement", Pattern Recognition Letters 19, 1998, pp. 1055-1065; CASPI et al., "Range Imaging with Adaptive Color Structured Light", IEEE Transaction on Pattern Analysis and Machine Intelligence, Vol. 20, No. 5, May 1998, pp. 470-480; and GRIFFIN et al., "Generation of Uniquely Encoded Light Patterns for Range Data Acquisition", Pattern Recognition, Vol. 25, No. 6, 1992, pp. 609-616

In addition, the remaining documents, copies of which are attached to this statement, are also made of record on the enclosed sheet.

A concise explanation of the relevance of these latter items is that we are advised by our client that these references were discovered during any searches they or their client had made, or that they were considered in the preparation of the application.

Respectfully submitted,

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RJP/psf

Enclosures: ☒ Form PTO-1449(s)
☒ Documents
☐ Foreign Search Report
☐ Other: _____

INFORMATION DISCLOSURE CITATION IN AN APPLICATION

(Use several sheets if necessary)

Attorney Docket No.:

4001-1194

Application No.:

10/521,605

Applicant:

RUMMEL et al.

Filing Date:

January 18, 2005

Group Art Unit:

2877

U.S. PATENT DOCUMENTS

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing date (if appropriate)
	6,341,016	Jan. 22, 2002	MALIONE			

FOREIGN PATENT DOCUMENTS

Examiner Initial	Document Number	Date	Country	Class	Subclass	Translation	
						Yes	No
	DE 196 38 727 A1	03/19/1998	Germany				
	DE 199 63 333 A1	07/12/2001	Germany				
	0 328 443 A1	08/16/1989	EPO				

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

	VUULSTEKE et al., "Range Image Acquisition with a Single Binary-Encoded Light Pattern", IEEE Transactions on Pattern Analysis and Machine Intelligence, Vol. 12, No. 2, February 1990, pp. 148-164
	SALVI et al., "A robust-coded pattern projection for dynamic 3D scene measurement", Pattern Recognition Letters 19, 1998, pp. 1055-1065
	CASPI et al., "Range Imaging with Adaptive Color Structured Light", IEEE Transactions on Pattern Analysis and Machine Intelligence, Vol. 20, No. 5, May 1998, pp. 470-480
	GRIFFIN et al., "Generation of Uniquely Encoded Light Patterns for Range Data Acquisition", Pattern Recognition, Vol. 25, No. 6, 1992, pp. 609-616
	BOYER et al., "Color-Encoded Structured Light for Rapid Active Ranging", IEEE Transactions on Pattern Analysis and Machine Intelligence, Vol. PAMI-9, No. 1, January 1987, pp. 14-28
	Friedrich M. WAHL, "A Coded Light Approach for Depth Map Acquisition", IBM Zurich Research Laboratory, pp. 12-17
	STAHS et al., "Surface Measurement performed by a 3D Robot Sensor", Zeitschrift fur Photogrammetrie und Fernerkundung, June 1990, pp. 190-202
	STAHS et al., "Fast and Robust Range Data Acquisition in a Low-Cost Environment", Institute for Robotics and Computer Control Technical University of Braunschweig, FRG, SPIE Vol. 1395 Close-Range Photogrammetry Meets Machine Vision, 1990, pp. 496-503
	HUGLI et al., "Generation and Use of Color Pseudo Random Sequences for Coding Structured Light in Active Ranging", SPIE Vol. 1010 Industrial Inspection, 1988, pp. 75-82
	MARUYAMA et al., "Range Sensing by Projecting Multiple Slits with Random Cuts", IEEE Transactions on Pattern Analysis and Machine Intelligence, Vol. 15, No. 6, June 1993, pp. 647-651
	PROESMANS et al., "One-Shot Active 3D Shape Acquisition", ESAT/MI2-VISICS, Katholieke Universiteit of Leuven, 1996, pp. 336-340
	PROESMANS et al., "Active Acquisition of 3D Shape for Moving Objects", ESAT-MI2, Katholieke Universiteit of Leuven, 1996, pp. 647-650

EXAMINER:

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

* Abstract provided for the Examiner's convenience